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VOICED OBSTRUENTS IN MIEN AND OLD CHINESE RECONSTRUCTIONS*

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Abstract
This paper presents additional data from Chinese loanwords into Hmong-Mien documenting the existence of prenasalization in Old Chinese, focusing on one variety: Jiangdi Mien. It additionally discusses methodological issues regarding the use of these loanwords in Old Chinese reconstruction, as well as Hmong-Mien reconstruction.

Keywords: Mien, proto-Hmong-Mien, Old Chinese, prenasalization, anticausative
ISO 639-3 codes: hmn, ium, hnj, pnu

1 Introduction

The Chinese contribution to the lexicon of Hmong-Mien languages is considerable. Chinese loanwords constitute a significant part of the reconstructible vocabulary (Ratliff 2010:225-227), and the oldest strata present a certain number of specificities not explainable from the phonological system of Middle Chinese (Baxter & Sagart 2014).

Among these potentially archaic phonological features, the presence of onset prenasalization (in Hmongic) or voicing (in Mienic, from prenasalized onsets) is of particular interest (Downer 1973): as pointed out by Norman (1986), there seems to be a recurrent correspondence between prenasalization in Hmong-Mien and the series of onsets reconstructed as 'softened initials' in his proto-Min. Moreover, Baxter & Sagart (2014:86) further show that some proto-Min 'voiced aspirated' initials also correspond to Hmong-Mien prenasalization, and attempt to make systematic use of these data in their reconstruction of Old Chinese, proposing four distinct nasal preinitials in OC ***N-**, ***m-**, ***Nə-**, ***mə-**, all reflected in Hmong-Mien (Baxter & Sagart 2014:95).

The aim of the present paper is to undertake a systematic investigation of prenasalization in Chinese loanwords in one Hmong-Mien language for which a rich documentation is available (Jiangdi 江底 Mien), in order to assess the full extent of this phenomenon and of how it can be used in Old Chinese in a systematic way, since the non-availability of Hmong-Mien data (and other non-conventional sources) makes reverifying Baxter and Sagart's reconstructions difficult (Hill 2019:191).

In Jiangdi Mien, as all members of the Mienic branch, the proto-Hmong-Mien prenasalization became onset voicing (§1.1). Building on previous scholarship (Downer 1973, Sagart 2003, Sagart & Baxter 2010, Wang 2012), I collected all examples of Chinese loanwords with voiced stops and affricates in Mao's (1992) Mien dictionary.[1]

In this paper, I first list out the observed correspondences involving MC obstruents in Mien (§1). Second, I discuss the possible historical hypotheses that can be put forward to account for the voicing in Mien (§2), including the possibility of a Mien-internal innovation (§2.1). I also tackle the difficult question of the date of borrowing of the etyma with voicing. Third, I evaluate the consequences of these observations

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[1] The spreadsheet containing all examples is included as supplementary material.

for the reconstruction of Old Chinese (§3) and propose a protocol for how to systematically handle Mien (and more generally, Hmong-Mien) data in Old Chinese reconstruction in a reproducible way.

2 Attested correspondences

This section presents the attested sound correspondences related to voiced obstruent onsets between Mien and other HM languages on the one hand, and with MC on the other hand.

2.1 The proto-Hmong-Mien origin of voicing in Mien

Mien has three series of stops and affricates: unvoiced unaspirated (**p-**, **t-**, **ts-**, **tɕ-**, **k-**), unvoiced aspirated (**pʰ-**, **tʰ-**, **tsʰ-**, **tɕʰ-**, **kʰ-**), and voiced (**b-**, **d-**, **dz-**, **dʑ-**, **g-**). The voiced series regularly corresponds to prenasalized unaspirated and aspirated obstruents in the common Hmong-Mien vocabulary Downer (1973:10), as illustrated by the Table 1 (data from Wang & Mao 1995, reconstructions by Ratliff 2010).

Table 1: *Voiced obstruents from prenasalization in Mien*

Proto-Hmong-Mien	Meaning	Hmongic: Jiwei	Hmongic: Fuyuan	Hmongic: Zongdi	Mienic: Jiangdi
***mpeiH**	dream	**mpei**^{5}	**mʔpu**^{C}	**mpɔ**^{5a}	**bei**^{5}
***mpɔuH**	name	**mpu**^{5}	**mʔpei**^{C}	**mpæ**^{5a}	**bwo**^{5}
***ntei**	cloth	**ntei**^{1}	**nʔtu**^{A}	**ntɔ**^{1a}	**dje**^{1}
***ntət**	weave	**nto**^{7}	–	–	**dat**^{7}
***ntɔŋH**	wear	**ntu**^{5}	**nʔtoŋ**^{C}	**ntaŋ**^{5a}	**doŋ**^{5}
***ntsjəuX**	salt	**ɳʈɕɯ**^{3}	**nʔtsi**^{B}	**ntsæ**^{3a}	**dzau**^{3}
***ntsʰjamX**	blood	**ɳʈɕhi**^{3}	**nʔtshen**^{B}	**ntsua**^{3b}	**dzja**:**m**^{3}
***ntsʰjeH**	fear	**ɳʈɕha**^{5}	**nʔtshe**^{C}	**ntse**^{5b}	**dzje**^{5}
***NKan**	cogongrass	–	–	**ŋkæin**^{1a}	**ga**:**n**^{1}
***NKhæj**	dry, thirsty	–	**ɴʔqhei**^{A}	**ŋka**^{1b}	**ga**:**i**^{1}

The aspiration contrast in prenasalized onsets is found in most Hmongic languages (in Zongdi Hmong, it is transphonologized to a tonal contrast), but has been neutralized in Mien.[2] However, only very few items with aspirated prenasalized onsets are reconstructible to proto-Hmong-Mien.

Proto-Hmong-Mien did have a voicing contrast, but the original voicing has been lost in nearly all varieties. The contrast between voiced and unvoiced onsets however has been transphonologized as a tonal register contrast (Haudricourt 1951, Chang 1953, 1973), following the same path as in neighbouring Sinitic and Kra-Dai languages (Fuyuan Hmong in Table 1 is one of the very few Hmong-Mien varieties without tonal bipartition). Table 2 represents the correspondences between the tones of Mien and proto-Hmong-Mien.

Table 2: *Tonal bipartition in Jiangdi Mien*

proto-Hmong-Mien Onset	A	B	C	D
Voiceless	1 (33)	3 (52)	5 (35)	7 (55)
Voiced	2 (31)	4 (231)	6 (31)	8 (12)

[2] Neutralization is not complete in Mun, where a distinct series of high-register tones is found in words which had an aspirated onset in proto-Hmong-Mien (Strecker 1990).

2.2 Regular onset correspondences between MC and Mien

The most recurrent correspondences between MC and Mien are presented in Table 3: both unvoiced unaspirated (全清) and voiced (全濁) obstruents correspond to unaspirated obstruents. The voicing contrast is preserved by the tonal register (1,3,5,7 vs 2,4,6,8, see Table 2 above).

Table 3: *Main correspondences between MC and Mien initial obstruents*

MC Initial	Mien initial	Tones
幫 **p-**	**p-**	1,3,5,7
滂 **pʰ-**	**pʰ-**	1,3,5,7
並 **b-**	**p-**	2,4,6,8
端 **t-**	**t-**	1,3,5,7
透 **tʰ-**	**tʰ-**	1,3,5,7
定 **d-**	**t-**	2,4,6,8
見 **k-**	**k-**, **tɕ-**	1,3,5,7
溪 **kʰ-**	**kʰ-**, **h-**	1,3,5,7
群 **g-**	**tɕ-**	2,4,6,8
知 **ʈ-**	**ts-**	1,3,5,7
徹 **ʈʰ-**	**tsʰ-**	1,3,5,7
澄 **ɖ-**	**ts-**	2,4,6,8
精 **ts-**	**ts-**	1,3,5,7
清 **tsʰ-**	**tsʰ-**	1,3,5,7
從 **dz-**	**ts-**	2,4,6,8
章 **tɕ-**	**ts-**	1,3,5,7
昌 **tɕʰ-**	**tsʰ-**	1,3,5,7
禪 **dʑ-**	**ts-**, **s-**	2,4,6,8
心 **s-**	**f-**	1,3,5,7
邪 **z-**	**ts-**	2,4,6,8
曉 **x-**	**h-**, **kʰ-**	1,3,5,7
匣 **ɣ-**	**h-**, **j-**	2,4,6,8
船 **ʑ-**	**ts-**	2,4,6,8

Typical examples of unvoiced obstruents in Mien corresponding to voiced stops or affricates in MC include **tu**[8] 'poison' (from 毒 **dowk**), the classifier **tau**[2] (from 頭 **duw** 'head'), **puŋ**[2] 'room' (from 房 **bjaŋ**), **tɕou**[2] 'bridge' (from **gjew**, with palatalization).[3]

In the immense majority of Chinese loanwords into Mien, MC voiced obstruents do *not* correspond to Mien voiced obstruents.

2.3 Onset voicing in Chinese loanwords

Combining the evidence included in Downer (1973) and Ratliff (2010) with an exhaustive search in Mao (1992), we find 154 potential examples of Chinese loanwords with voiced stops and affricate initials (**b-**, **d-**, **dz-**, **dʑ-**, **g-**) in Mien and obstruent initials in Chinese.[4] The rhyme correspondences in Downer (1973:32) have been systematically used to recheck the plausibility of the new etymologies.

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[3] Since the 群 **g-** initial in MC only occurs with medial -j-, all examples of loanwords with this initial consonant have the palatalized onset **tɕ-** rather than **k-**.

[4] In addition to these correspondences, the cluster ***mbr** in HM also corresponds to MC **l-** (from OC ***m.r-**). The reconstruction of these clusters is controversial (Ostapirat 2016, Ratliff 2018) and is not discussed in the present paper.

Some the examples included in the database have either phonetic or semantic problems (indicated in the spreadsheet with a question mark) and may be incorrect etymologies. Problematic examples with unique rime correspondences include **dʑi**:**n**^{5} 'limit' (n) (possibly from 限 **ɣɛnX**), **do**:**ŋ**^{3} 'dull, of knife' (adj) (possibly from 鈍 **dwonH**), **doŋ**^{5} 'prop' (v) (possibly from teŋX). We also find a few examples with tone 3 in Mien corresponding to a **-k** coda in MC: **bou**^{3} 'practice divination' (from 卜 **puwk**), **bwo**^{3} 'accept, submit (服氣)' (from 服 **bjuwk**).

Attested correspondences generally display the voiced counterpart of the place of articulation found in the regular correspondences (Table 3): all labials correspond to **b-**, all coronal stops to **d-**, coronal affricates and retroflex stops to **dz-** (also **dʐ-** in a few cases) and velar stops and fricatives to **g-** or **dʑ-** (in second and third division). The MC dental fricative **s-** (whose regular reflex is **f-**) merges with coronal affricates as **dz-**.

In terms of stratification, it is quite obvious that the words presenting the correspondences in Table 4 do not belong to one single layer, since the rhyme correspondences are not uniform (for instance **-æw** 肴 has three reflexes: **-eu**, **a**:**u** and **-au**).

Some words such as **da**:**m**^{1} 'carry on shoulders' (MC **tam**) have reflexes in most HM languages that point to a loanword in the proto-language. Other ones such as **bau**^{5}**ho**^{1} 'mint' is closer to Mandarin 薄荷 **bòhe** than to the corresponding MC reading **bak ɣa** and cannot be ancient. Thus, before using Mien voicing in loanwords as evidence for prenasalization in OC, some caution is necessary.

3 Historical interpretation

3.1 Voicing as a Mien innovation?

In order to account for the presence of unexpected onset voicing in Chinese loanwords, one possibility would to assume that Hmong-Mien native morphology was applied to those loanwords. Since prenasalization appears to be the only origin of Mien voicing in the Hmong-Mien inherited lexicon, it could be possible in principle to hypothesize that Mien (and other HM languages) have added nasal prefixal elements to borrowed words.

In particular, many languages require loaned verbs to take denominal morphology to serve as verbs in the target language, a phenomenon that Wohlgemuth (2009) calls 'indirect insertion'. It is for instance the case in Chinese loanwords into Japhug (Jacques 2019).

However, Hmong-Mien languages are among the languages for which the least evidence for ancient native morphology exists (Ratliff 2010:210-213).

In borrowings from Chinese, some traces of morphology are observed. We find a few tonal alternations, such as Mien **tu**^{8} 'poison' (n) (from 毒 **dowk**) vs **tu**^{6} 'to poison (fishes)' (vt) from the qusheng denominal derivation of the same noun. There are also a handful of transitivity alternations marked by voicing in Mien. Downer (1973) pointed out the following two pairs of examples:

1. **kʰo**:**i**^{1} 'open (tr)' and **go**:**i**^{1} '(spontaneously) open' (also used as resultative verb in complex predicates) from 開 **kʰoj** 'open'
2. **tsʰɛ**^{7} 'pull down' (house) and **dzɛ**^{7} 'be cracked' (of earth, of skin) from 拆 **ʈʰæk** and 坼 **ʈʰæk** respectively.

To these pairs, one may potentially add **pɛ**:**ŋ**^{1} 'to stretch tight, to pull tight' (绷；拉紧；拔) and **bɛ**:**ŋ**^{1} 'to crack' (裂开; it can be seen as the resultative of the action of the transitive verb), with an unaspirated onset for the transitive counterpart.

The absence of comparable pairs in the native vocabulary is a strong arguments *against* analyzing voicing in this case as native Hmong-Mien morphology, but rather to view it as a trace of Chinese morphology only preserved in loanwords (Sagart 2003), as discussed below in more detail (§3.1).

Genuine inherited alternations in Hmong-Mien are very rare. There is a unique proto-HM voicing alternation (reflected as tone register in Mien) in Mien **taj**^{5} 'kill' vs **taj**^{6} 'die' (from proto-Hmong-Mien ***təjC** vs **dəjC**, an intringuing pair possibly related to Austronesian, Ratliff 2010:210-213).

***Table 4:** Correspondences of voiced obstruents onsets in Mien to MC*

Mien	MC	Examples	Mien	MC
b-	**p-**	14	**ba**:**ŋ**[1] 'collapse, miscarriage'	崩 **poŋ**
	pʰ-	3	**beu**[1] 'throw'	拋 **pʰæw**
	b-	24	**beu**[5] 'report'	報 **bawH**
d-	**t-**	8	**dou**[3] 'bet'	賭 **tuX**
	tʰ-	4	**di**[7] 'kick'	踢 **tʰek**
	d-	15	**du**[8] 'alone'	獨 **duwk**
	dʑ-	1	**djaŋ**[5] 'tree'	樹 **dʑuH**
	ʈ-	1	**pu**[2]**doŋ**[5] 'among'	中 **ʈjuwŋ**
	ɖ-	1	**djou**[2] 'pillar'	柱 **ɖjuX**
dz-	**ts-**	11	**dzou**[1] 'rent'	租 **tsu**
	tsʰ-	3	**dzeŋ**[3] 'move slowly in the bed while asleep' (of children)	蹭 **tsʰoŋH**
	dz-	8	**dzje**[8] **dzi**:**ŋ**[1] 'still and quiet'	寂靜 **dzek dzjeŋX**
	tɕ-	6	**dzip**[7] 'fold'	摺 **tɕep**
	tɕʰ-	4	**dzi**[7] 'cane' (to punish disobedient children)	尺 **tɕʰek**
	dʑ-	1	**dzaŋ**[2] 'tenth'	成 **dʑeŋ**
	ʈ-	2	**dzwan**[5] 'get back; roundtrip'	轉 **ʈwjenH**
	ʈʰ-	2	**dzɛ**:**ŋ**[1] 'punt (boat)'	撐 **ʈʰæŋH**
	ɖ-	1	**dze**:**n**[6] 'coil around'	纏 **ɖjen**
	tʂ-	2	**dzɛ**:**ŋ**[1] 'argue'	爭 **tʂɛŋ**
	dʐ-	2	**dzau**[2] 'worry'	愁 **dʐjuw**
	s-	4	**dzi**:**ŋ**[1] 'rank smell'	腥 **seŋ**
dʑ-	**k-**	7	**dʑa**:**u**[5] 'teach'	教 **kæw**
	kʰ-	1	**dʑwat**[7] 'curved'	屈 **kʰjut**
	g-	2	**dʑi**:**m**[2] 'pincers'	箝 **gjem**
	x-	1	**dʑa**:**n**[2] 'snore'	鼾 **xan**
	ɣ-	4	**dʑin**[5] 'limit'	限 **ɣɛnX**
	tʂ-	1	**dʑei**[6] 'bare teeth'	齜 **tʂje**
	ɖ-	1	**dʑu**[8] 'turbid'	濁 **ɖæwk**
g-	**k-**	12	**gun**[1] 'cockscomb'	冠 **kwan**
	kʰ-	7	**gau**[5] 'knock'	敲 **kʰæw**
	ɣ-	3	**gwe**:**n**[6] 'county'	縣 **ɣwenH**

In Mien, additional possible traces of morphology include **pwei**[5] 'sleep' vs **bei**[5] 'dream'[5] and **pja**[3] 'stick' (proto-HM ***prjaX**) vs **bja**[6] '(walk) with a walking stick' (拄). In these pairs, it is conceivable that the etymon with a voiced initial originally had a nasal prefix, and derives from the form with an unvoiced initial. However, tone 6 in **bja**[6] suggests that this form, if ancient, should be projected back to proto-HM ***mbrjaH** with a prenasalized voiced initial:[6] even if this verb is indeed related to the noun **pja**[3], it is by no means

[5] Martha Ratliff points out (pc) that 'dream' could be related to PAN *Sepi 'dream' (cf. Proto-Atayalic *mi-Sepi), while 'sleep' lacks an AN counterpart.

[6] The ***-r** is posited to account for the vowel **-a**; the proto-form ***mbjaH** yields **bje**[6] 'step' (from 步 **buH** from ***Nə-bˁa-s** in Baxter and Sagart's system). Another example of the ***-r-**blocking the fronting is provided by **pja**[1] 'five' from ***prja** (Ratliff 2010).

straightforward to analyse this fossil morphology, in the absence of a language in the family where it would still be productive.

In conclusion, even though the evidence for morphology involving prenasalization and voicing in Mien is not entirely absent, the possible examples are either loanwords from Chinese or highly speculative pairs. Even if Hmong-Mien did indeed used to have a native nasal prefix, this morphology had in any case ceased to be productive at a very early stage, so that it is of little relevance for the study of Chinese loanwords. The zero assumption when observing voicing in a Chinese loanword from Chinese should thus be that this voicing was *present in the donor language* (either under the form of voicing or as prenasalization) and cannot be ascribed to a morphological alternation within Mien (Sagart 2003, 1999, Sagart & Baxter 2010).[7]

3.2 Voiced obstruents in Mien corresponding to unvoiced obstruents in MC

Since, as argued in the previous section, our present knowledge of Hmong-Mien historical linguistics does not support the idea that prenasalization was a productive native morphological process at the time of contact with Chinese, all examples of Chinese loanwords with voiced initials and high register tone in Mien corresponding to Chinese unvoiced (aspirated or non-aspirated) obstruents can safely be assumed to have had prenasalized unvoiced onsets in the donor language.

Some loanwords with voiced initial present clear traces of OC phonological characteristics. For instance **bje**^{3} 'patch, mend', which is reconstructible to proto-HM (**mpjaX**, Ratliff 2010:44), has a vowel that does not go back to MC 補 **puX**, but rather to OC ***-aʔ**, and must have been borrowed before the change from ***-a** to **-u**.

The verb **bjo**:**t**^{8} 'boil' (vi) has **-t** coda lost in MC 沸 **pjijH**, but reconstructible to OC (B/S ***Nə.p[u][t]-s**), suggesting an Old Chinese borrowing. This etymon has also been borrowed as **bwei**^{5} with the tone expected from MC (this last etymon has direct cognates in other Hmong-Mien languages).

Most examples however display typically MC characteristics: we provide below three criteria showing the late character of these borrowings.

First, **dzou**^{1} 'rent' (from 租 **tsu**) and **dou**^{3} 'bet' (from 賭 **tuX**) cannot be OC loanwords, since they go back to etyma with the OC rhyme ***-a** (魚部) and would be expected to have either **-a** or **-je** in Mien if there were from OC.

Second, etyma from second-division words such as **beu**^{5} 'panther' (from**pæwH**), **bɛ**^{7} 'soul' (from 魄 **pʰæk**), **bɛ**^{7} 'strike' (from 拍 **pʰæk**) or **beu**^{1} 'throw' (from 抛 **pʰæw**) should all have trace of an ***-r-** or ***-l-** medial in Mien (**-j-** in the Jiangdi variety) if they were borrowed from OC.

Third, all words with affricates corresponding to MC alveolo-palatal affricates (such as **dzi**^{7} 'cane' from 尺 **tɕʰek** < ***tʰAk**) must also be MC loanwords, otherwise a dental stop would be expected in Mien.

It is therefore clear that the bulk of loanwords with voicing in Mien corresponding to MC unvoiced obstruents is not from OC, but rather from non-standard MC dialects which preserved prenasalization.

A particularly interesting correspondence is that of Mien **dz-** to MC **s-** (Table 5). MC **s-** normally corresponds to Mien **f-** (Table 3 above), a correspondence due to a Jiangdi Mien-internal sound change, since it also affects the native word **fat**^{7} 'near'. The complete sound shift was probably ***s- *θ-** > **f-**, since other Mien dialects such as Luoxiang have **θ** corresponding to Jiangdi **f**.

Table 5: *Correspondence of MC 心 to Mien **dz-***

Jiangdi Mien	Meaning	MC
dza:**n**5	scatter	散 **sanH**
dzje5	tear	撕 **sej**
dzja:**u**1	rank smell (of goat)	臊 **saw**
dzi:**ŋ**1	rank smell (of fish)	腥 **seŋ**

The **dz-** in **dza**:**n**^{5} comes from ***ntsʰ-** rather than ***nts-**, as shown by the cognate **da**:**n**$^{5'}$ 'scatter' in Lanjin Mun, where tone 5' occurs with aspirated onsets (Ratliff 2010:73). Thus, prenasalized ***ns-** in the

[7] This assumption, on which all the following discussion is based, can be abandoned only if at least three pairs of non-Chinese etyma presenting a prenasalization/voicing alternation with a well-identified meaning, are found in any Hmong-Mien language.

donor Chinese dialect underwent epenthesis to ***nts^{h}-*** in proto-Mien (Baxter & Sagart 2014:177), following a sound change also attested in Tibetan (Li 1933). The epenthesis predates the change ***s-*** > ***θ*** and bleeds it. An anonymous reviewer points out that the Min cognates of 臊 **saw** and 腥 **seŋ** have affricates (Xiamen **ts^{h}o**[1] and **ts^{h}ĩ**[1]), which would rather suggest onsets such as ***s-ts^{h}-*** (Baxter & Sagart 2014:141).

The prenasalized reflexes of OC prenasalized laterals are more difficult to interpret. The verbs **do**:**t**[7] 'lose, drop' and **dut**[7] 'lose' (teeth) are both borrowed from 脫 **t^{h}wat**, which had an aspirated lateral ***mə-l̥ˤot*** (Baxter & Sagart 2014:180). The **d-** with high-register tone points to an onset ***nt(^{h})-***in proto-Mien. This could either mean that the donor Chinese dialect had undergone the sound change ***l̥ˤ-*** > **t^{h}-** like MC. Alternatively, this could also indicate that ***n-hl-*** merges with ***nt^{h}-*** in proto-Mien.

3.3 Voiced obstruents in Mien corresponding to voiced obstruents in MC

The correspondence of MC voiced stops and affricates (並 **b**, 定 **d**, 澄 **ɖ**, 從 **dz**, **dzr**, 崇 **dzr**, 群 **g**) to Mien voiced obstruents is more difficult to interpret than that of MC unvoiced obstruents. It is not possible to exclude that some loanwords have been borrowed from varieties of Chinese preserving the voicing, but *after* the transphonologization of prenasalization to voicing in Mien. In such a case, voicing in Mien cannot be taken as evidence for prenasalization in OC.

Thus, in the case of words with low-register tones (2, 4, 6, 8) such as **doŋ**[6] 'like' (from 同 **duwŋ**) or **doŋ**[2] 'tube' (筒 **duwŋ**), both reconstructed with a lateral initial ***l̥ˤoŋ***, voicing in Mien is not compelling evidence for positing here a cluster ***n-l-*** in OC without additional confirming evidence.

However, there are two cases when a Mien voiced obstruent corresponding to a MC voiced obstruent can nevertheless be considered sufficient evidence for prenasalization.

First, there are a handful of words in Mien with a voiced onset and a *high-register* tone (1, 3, 5, 7) corresponding to MC voiced initial. Table 6 indicates the clearest examples.[8] Some of the syllables are first or second element of compounds, but their high register cannot be ascribed to tone sandhi (Mao 1992:7-8).

Table 6: *Mien high register tone voiced onsets corresponding to MC voiced obstruents*

Mien	Meaning	Onset	MC
(dzje8**)dzi**:**ŋ**1	'still and quiet'	**dz-** < ***nts(^{h})***	靜 **dzjeŋX**
(bjau2**)bau**1	'fish bladder'	**b-** < ***mp(^{h})***	鰾 **bjewX**
deŋ5**(tsa**8**)**	'upright'	**d-** < ***nt(^{h})***	挺 **deŋ(X)**
dwo3	'coax, cheat'	**d-** < ***nt(^{h})***	逗 **duwH**
bun5	'clumsy, silly'	**b-** < ***mp(^{h})***	笨 **bwonX**

In these words, if the donor Chinese dialect had had plain voiced onsets, a low-register tone would have been expected in Mien. Hence, it can be assumed that in the donor Chinese dialect prenasalized *unvoiced* onsets corresponding to MC voiced ones. In Baxter and Sagart's (2014:95) system, such cases would be reconstructed with the preinitials ***m-*** or ***N-***. Additional examples of this correspondence are found in OC morphological alternations preserved in Mien (§3.1).

Second, a few Chinese loanwords with voiced obstruent onsets and low-register tone in Mien have cognates with prenasalization in Hmongic, for instance **bin**[4] 'braid' from 辮 **benX** (Ratliff 2010:48). In such case, even if the Mien form itself is ambiguous, comparative HM evidence proves that prenasalization is genuine.

Among common HM Chinese loanwords, Mien **dza**:**ŋ**[3] 'boat', likely borrowed from **zʷen** (OC ***Cə.lo[n]*** as shown by Min ***-dž***, 2014:190), is very puzzling.

Since the initial **zʷ-** goes back to a lateral initial in Old Chinese, and since the cognates of Mien **dza**:**ŋ**[3] have no trace of aspiration in Mun and Hmongic, it is not possible to suppose the presence of an aspirated ***l̥*** in this etymon. Moreover, the affricate initial cannot reflect an Old Chinese loanword.

[8] Another possibility would be **bjet**[7] 'cut' (weed) if from 拔 **bɛt** 'pull out' despite the difference in meaning.

Table 7: *Voicing alternation and transitivity*

Unvoiced form	Meaning	Voiced form	Meaning
別 **pjet** （幫）	separate	別 **bjet** （並）	take leave
敗 **pæjH** （幫）	defeat	敗 **bæjH** （並）	be defeated
斷 **twanH** （端）	cut	斷 **dwanH** （並）	be cut, stop
折 **tɕet** （章）	break (tr)	折 **dʑet** （常）	break (it), be broken, die young
屬 **tɕuwk** （章）	compose	屬 **dʑuwk** （常）	belong to
見 **kenH** （見）	see (tr)	現 **ɣenH** （匣）	appear
繫 **kejH** （見）	tie	繫 **ɣejH** （匣）	be tied
解 **kɛiX** （見）	untie	解 **ɣɛiX** （匣）	be loosened
會 **kwajH** （見）	gather (vt)	會 **ɣwajH** （匣）	gather (vi)
壞 **kwɛjH** （見）	destroy	壞 **ɣwɛjH** （匣）	be destroyed
夾 **kɛp** （見）	hold between	狹 **ɣɛp** （匣）	be narrow

4 Consequences for OC reconstruction

The fact that voicing originating from prenasalization is found in loanwords with MC phonological characteristics (§2.2) implies that prenasalization should not only be projected to proto-OC, but even as late as the Han dynasty. Hence, even if one does not accept all of Baxter and Sagart's (2014) methodological innovations and their particular solutions ***N-**, ***m-**, ***Nə-** and ***mə-** to account for the observed correspondences, no future reconstruction of OC can afford disregarding these data.

4.1 Hmong-Mien prenasalization and OC morphology

Hmong-Mien data plays an important role in Sagart and Baxter's (2012) analysis of voicing transitivity alternations, as attested by the pairs in Table 7 (data from Chou 1962:79-80; 86 and Sagart 2003:758).[9]

The voicing alternation, according to Baxter and Sagart, originates from the prefixes ***N-** and ***m-** (Sagart & Baxter 2012, Baxter & Sagart 2014:54-120)[10] which voice the following obstruent (for instance 折 **dʑet** is reconstructed as ***N-tet**). This hypothesis is inspired by the pairs of loaned verbs which have an intransitive form with a voiced initial and high register tone (hence prenasalized unvoiced onset in proto-Mien), for instance **kʰo**:**i**[1] and **go**:**i**[1] from 開 **kʰoj** 'open' (see above in §2.1).[11]

This interpretation of the MC voicing alternation is also compatible with comparative data from more conservative Trans-Himalayan languages, in particular Rgyalrongic, where it corresponds either to anticausative prenasalization (and the related spontaneous-autobenefactive **nɯ-**, a productive prefix, Jacques 2015) or to the agentless passive ***ŋa-** (Zhang et al. 2019).

However, it should be noted that the pairs of verbs in Table 7 have a *voice* alternation in MC. Since Mien voicing from prenasalization is only reflected in MC in a minority of cases (§2.3), equating voice alternation in MC and voicing in Mien is problematic. Baxter & Sagart (2014:120) suggest reconstructing two allomorphs of the intransitivizing prefix ***N-** and ***Nə-**, the former causing voicing in Chinese (Table 7),

[9] Chou (1962:86) analyzes some of these examples as 既事式 'perfect', by which is presumably implied a resultative meaning. Baxter & Sagart (2014:120) also propose the pair 曲 **kʰjowk** 'bend, bent' vs 局 **gjowk** 'bent, curved', but it is unclear whether this example can really be interpreted as a transitivity alternation.

[10] The preinitial **m-** is reconstructed when a cognate with voiced aspirated obstruents is found in Min, Baxter & Sagart 2014:123), and ***N-** when both MC and proto-Min have a plain voiced obstruent.

[11] In addition to the examples quoted in that section, one notes the adjective **dʑwat**[7] 'curved' from the verb 屈 **kʰjut** which can be used both transitively 'bend or intransitively 'bent' in Chinese, suggesting that Mien has only borrowed the intransitive counterpart (see Baxter & Sagart 2014:387 for a possible Hmongic cognate, indicating that borrowing may have taken place in proto-HM).

and the latter disappearing in MC (§2.1), but both reflected as prenasalization in HM.[12] However, their hypothesis would be better supported if examples of intransitive verbs in Table 7 were found with direct evidence of prenasalization in a Hmong-Mien language.

Among the pairs with transitivity alternation in table 7, only two are found in the Jiangdi Mien data: the intransitive 敗 **bæjH** and the intransitive counterpart of 夾 **kɛp** 'hold between' (狹 **ɣɛp**), respectively reflected by **pa**:**i**^{6} 'lose, downfall' and by **kap**^{8} 'be squeezed' (example 1) (外力压挤, Mao 1992:149), both with an unvoiced stop with low register tone, pointing to proto-Mien ***b-** and ***g-** without prenasalization. In both cases, if Baxter and Sagart's hypothesis is correct, borrowing must have taken place after the loss of prenasalization in Chinese. The donor Chinese variety was nevertheless more archaic than MC, since the initial **k-** did not undergo fricativization to **ɣ-** (otherwise, it would be reflected as **h-** with low-register tone, see the later loan **hep**^{8} 'narrow' from MC 狹 **ɣep**).

(1) *je*^{1} *ɲei*^{1} *pwo*^{2}*du*^{7} *kap*^{8} *mun*^{1} *ɲa*^{6}
1SG GEN finger get.squeezed hurt PFV
'My finger hurts after having got squeezed.'

However, the intransitive counterpart of 夾 **kɛp** may additionally be reflected by **dʑa**:**p**^{8}, a technical term difficult to translate precisely without *in situ* fieldwork, explained in Mao's dictionary as meaning 'firmly attach wood planks or tree bark with bamboo chips or branches to make a wall cover' (专指以竹片或枝条把木板或树皮夹扎成壁). Example (2)[13] does not prove that this verb cannot be used transitively.[14] The low-register tone with voiced initial points to a proto-Mien voiced prenasalized onset ***ŋgja**:**p**,[15] possibly borrowed from Chinese after voicing but before loss of prenasalization.

(2) *wo*^{3} *no:m*^{1} *tɕi:n*^{1} *tsei*^{4} *loŋ*^{6} *pe:n*^{3} *dʑa:p*^{8} *tɕen*^{3} *ɲei*^{1}
That CL room be use plank squeeze PROG GEN
'That room (has its walls) made of tightly attached planks.' (那间房是用木板夹起的)

This example is thus a possible direct evidence for prenasalization in one of the verbs with voicing alternation in MC.

In Hmongic, a few pairs of verbs from Chinese with voicing transitivity alternation are also attested, for instance ***ci**^{C} 'burn' vs **ʝi**^{C} 'be burned' (from 炙 **tɕek, tɕæH**, Ratliff 2010:77-78),[16] but the intransitive counterpart in these forms does not have prenasalization. However, we find an interesting triplet in Green Hmong (data from Lyman 1974): **klao**^{3} (from proto-Hmongic ***qlәŋ**^{B}) "roll (up)" (transitive), **klao**^{4} (from ***ɢlәŋ**^{B})"roll" (intransitive) and **ŋglao**^{4} (from ***ɴɢlәŋ**^{B})"roll by itself, slip" (intransitive), with two intransitive voiced forms, one of which has an onset going back to a voiced prenasalized cluster. These verbs are possible borrowings from 卷 **kjwenX** (***kronʔ**) 'roll': the two intransitive verbs may reflect the same anticausative derivation ***nə-kronʔ**, borrowed two times: note also the Jiangdi Mien verbs **dʑun**^{3} 'curl', **dʑun**^{6} 'roll' and **gwan**^{1} 'roll' from the same source. The semantic difference between **klao**^{4} "roll" and **ŋglao**^{4} "roll by itself", the latter with a 'spontaneous' meaning, could also reflect two distinct derivations in OC (compare this form with the semantics of the spontaneous-anticausative **nɯ-** prefix in Rgyalrong, which Jacques 2015 argues to be the source of anticausative derivations).

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[12] In previous publications, they suggested an alternative hypothesis: the prenasalization could only voice unaspirated stops and affricates, not aspirated obstruents (and presumably fricatives). Baxter and Sagart also distinguish between two nasal presyllables ***Nə-** and ***mə-**. However, the data on which this contrast is based is unclear: they are given identical correspondences in MC (no trace), HM (prenasalization) and Min (softened initials). For these reasons, this distinction is not made in this paper, and the notation ***nə-**is used instead as a cover symbol for both.

[13] The English translation is provisional; the Chinese original has a one-to-one relationship with the Mien sentence but cannot be translated too literally into English.

[14] If it is confirmed that this verb can be transitive, then either one has to assume that it represents another Chinese etymon, for instance the related 挾 **ɣep** 'seize from both sides', or one needs to assume that a generalization of the intransitive form has taken place, in a way similar to Chinese varieties where reflexes of 繫 **ɣejH** are used as a transitive verb.

[15] A cluster ***ŋkl-** would also be possible.

[16] The verb 炙 **tɕek** is also borrowed as **tsi**^{7} 'parch, oven dry' in Jiangdi Mien.

4.2 Alternation or stratification?

While HM prenasalization in loanwords is indeed crucial to OC reconstruction, the complex stratification of the layers preserving the prenasalization requires careful investigation, especially when it comes to interpreting the presence or absence of prenasalization as traces of morphology.

We observe a few pairs of Chinese loanwords in Mien differing by voicing, but otherwise with identical tone and rhyme (Table 8).

Table 8: *Voicing contrast in Mien etyma corresponding to MC unvoiced obstruents*

Unvoiced	Voiced	MC
tsip^{7} 'receive'	**dzip**^{7} 'continue' (继续：接着)	接 **tsjep**
tsʰi^{7} 'ruler'	**dzi**^{7} 'cane' (戒尺)	尺 **tɕʰek**

The voiced Mien forms require positing a nasal prefix in OC (***Nə-** or ***mə-** in Baxter and Sagart's system, simplified as **nə-** here): **dzip**^{7} 'continue' and **dzi**^{7} 'cane' thus come from **tsjep** < ***nə-tsap** and **tɕʰek** < ***nə-tʰAk** respectively.

Concerning the unvoiced forms **tsip**^{7} 'receive' and **tsʰi**^{7} 'ruler' however, we are left with two mutually exclusive possibilities. First, they could belong to the same stratum as their voiced counterpart, in which case the difference in voicing reflects a morphological alternation that has left no trace in Chinese. Second, alternatively, these etyma may have had a ***nə-** presyllable without morphological function, and the unvoiced forms **tsip**^{7} 'receive' and **tsʰi**^{7} 'ruler' belong to a later stratum where prenasalization is lost, which just happens to have the same rhyme correspondences with the stratum of their voiced counterpart.

For this reason, Hmong-Mien evidence for prenasalization in OC is not easy to interpret in terms of morphology without additional support from other sources of data (including MC, Min or Viet-Muong).

While the Mien evidence for reconstructing prenasalization in OC is very clear, the fact that a considerable number of layers of Chinese loanwords have to be posited means that we can never be absolutely certain where *not* to reconstruct prenasalization, especially since the stratification of Chinese loanwords in Hmong-Mien have not yet been sufficiently investigated.

3.3 Use of the new Mien evidence for OC reconstruction

The data collected in this paper provide new evidence of prenasalization in a certain number of Chinese etyma. As shown in Table 9, they allow to amend Baxter and Sagart's (Baxter & Sagart 2014) reconstruction by adding a nasal presyllable ***nə-** (for their ***Nə-** or ***mə-** presyllables).[17]

In the case of 反 **pjonX** 'turn over and 崩 **poŋ** 'collapse', a softened initial ***-p** is found in Min (Baxter & Sagart 2014:186). For 縣 **ɣwenH** 'county', no Min data are provided, but the reconstruction ***Cə.[g]$^{w\varsigma}$e[n]-s** implies a softened initial.[18]

Among these forms, **dzjaŋ**^{1} 'weigh' is of particular importance for the reconstruction of morphology. Baxter & Sagart (2014:55) reconstruct **tɕʰiŋ** 'weigh' as ***tʰəŋ** without any nasal presyllable, but on the other hand posit a nasal presyllable in the derived noun 稱 **tɕʰiŋH** 'steelyard' (OC ***mə-tʰəŋ-s**) on the basis of HM data (such as Mien **dzjaŋ**^{5} 'steelyard'). They interpret this ***mə-** element as a prefix 'chang[ing] a verb into an agentive/ instrumental noun'. However, Mien data indicate that both the noun and the verb had prenasalization. This implies that whatever the nature of this prenasalization, it cannot be interpreted as a nominalizing prefix.[19]

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[17] Some of the reconstructions proposed here have been anticipated by Handel (2010) on the basis of Min data.

[18] For 臊 **saw** the reconstruction ***[m.s]$^{\varsigma}$aw** is provided in the online appendix, but there is no evidence for the ***m-** this word in (Baxter & Sagart 2014). According to their system, it is unclear what ***m.s$^{\varsigma}$-** should yield, but a voiced onset would be expected.

[19] The noun 稱 **tɕʰiŋH** 'steelyard' is a typical example of the ***-s** nominalization suffix (Downer 1959, Jacques 2016).

Table 9: *Revisions of some of Baxter and Sagart's (2014) reconstruction in light of Mien evidence*

Mien	MC	B/S 2014	amended OC
ba:**ŋ**[1] 'collapse, miscarriage' (v)	崩 **poŋ**	***Cə.pˁəŋ**	***nə-pˁəŋ**
beu[5] 'report' (v)	報 **pawH**	***pˁuk-s**	***nə-pˁuk-s**
beu[5] 'explode' (v)	爆 **paewH**	***pˁrawk-s**	***nə-pˁrawk-s**
beu[5] 'panther' (n)	豹 **paewH**	***pˁr[e]wk-s**	***nə-pˁr[e]wk-s**
(wan[2]**)bɛ**[7] 'soul' (n)	魄 **pʰæk**	***pʰˁrak**	***nə-pʰˁrak**
bjen[3] 'turn over' (v)	反 **pjonX**	***Cə.panʔ**	***nə.panʔ**
dje[3] 'bottom' (n)	底 **tejX**	***tˁijʔ**	***nə-tˁijʔ**
du:**i**[1] 'pile up' (v)	堆 **twoj**	***C.tˁuj**	***nə-tˁuj**
dzi[7] 'cane' (n)	尺 **tɕʰek**	***tʰAk**	***nə-tʰAk**
dzip[7] 'continue' (v)	接 **tsjep**	***[tsa]p**	***nə-[tsa]p**
dzjaŋ[1] 'weigh' (v)	稱 **tɕʰiŋ**	***tʰəŋ**	***nə-tʰəŋ**
dzja:**u**[1] 'rank smell (of goat)' (n)	臊 **saw**	***[m.s]ˁaw**	***nə-sˁaw**
dzun[5] 'drill' (n; v)	鑽 **tswan(H)**	***[ts]ˁor(-s)**	***nə-[ts]ˁor(-s)**
dzwei[1] 'beat' (v)	捶 **tɕweX**	***tojʔ**	***nə-tojʔ**
dʑa:**u**[5] 'teach' (v)	教 **kæw(H)**	***s.[k]ˁraw**	???
dʑɛ[7] 'be separated by' (v)	隔 **kɛk**	***[k]ˁrek**	***nə-[k]ˁrek**
dʑou[5] 'saw' (n)	鋸 **kjoH**	***k(r)a-s**	***nə-k(r)a-s**
dʑou[5] 'save' (v)	救 **kjuwH**	***s.k(r)u-s**	???
ga:**i**[1] 'lid, cover' (n)	蓋 **kajH**	***[k]ˁap-s**	***nə-[k]ˁap-s**
gjwaŋ[1] 'light, bright' (n; adj)	光 **kwaŋ**	***kʷˁaŋ**	***nə-kʷˁaŋ**
gun[1] 'cockscomb' (n)	冠 **kwan**	***[k.ʔ]ˁor**	***nə-[k.ʔ]ˁor**
goŋ[1] 'bow, stoop' (v)	拱 **kjowŋX**	***k(r)oŋʔ**	***nə-k(r)oŋʔ**
gwan[1] 'roll over' (翻卷, v)	卷 **kjwenX**	***[k](r)o[n]ʔ**	***nə-[k](r)o[n]ʔ**
gwe:**n**[6] 'county' (n)	縣 **ɣwenH**	***Cə.[g]ʷˁe[n]-s**	***nə-[g]ʷˁe[n]-s**

The cases of **dʑa**:**u**[5] 'teach' and **dʑou**[5] 'save' also present a particular interest. The palatalization in these verbs is expected, since their MC equivalents 教 **kæw(H)** and 救 **kjuwH** are second and third division respectively. Baxter & Sagart (2014:137) reconstruct a cluster ***s.[k]-** for both verbs; in the case of 教 **kæw** 'teach' this protoform is based on Min (Jiàn'ōu **xau**[1] with a **x-** onset instead of expected **k-**).[20] The voicing in Mien suggests that whatever reconstruction is posited for OC, it must have involved a nasal element.[21]

Additionally, it is possible to propose new OC reconstructions with prenasalization, for etyma not included in Baxter & Sagart (2014) and their online spreadsheet (Table 10).

For 鳩 **kjuw** 'turtledove', further evidence for prenasalization is found in Hmongic: Jiongnai **ŋku**[1] (Mao & Li 2002:260).

[20] No evidence is provided for the reconstruction of the initial cluster in 救 **kjuwH**, but it is presumably also based on Min data.

[21] In order to account for the initial **x-** in Min (distinct from softened initials), a possibility is that ***s.Nk-** simplified to ***s.k-** in the ancestor of Min and MC, but to ***Nk-** in the Chinese dialect from which Mien borrowed these verbs.

Table 10: *New OC reconstructions with prenasalization*

Mien	MC	OC
–bau[1] 'fish bladder' (n)	鰾 **bjewX**	***N-pewʔ**
bje[5] 'numb(ness)' (n; v)	痺 **pjie** or 痹 **pjijH**	***N-pe** or ***N-pi-s**
bun[5] 'clumsy, silly' (adj)	笨 **bwonX**	***N-pᶜənX**
di[7] 'kick' (v)	踢 **tʰek**	***nə-l̥ᶜek**
din[1] 'be mad' (adj)	癲 **ten**	***nə-tᶜi[n]**
dwo[3] 'coax, cheat' (v)	逗 **duwH**	***N-tᶜo-s**
(no[8]**)gu**[1] 'turtledove' (v)	鳩 **kjuw**	***nə-ku**
dza:**t**[7] 'rub' (v)	擦 **tsʰat**	***nə-tsʰat**
dzeŋ[3] 'move slowly' (v)	蹭 **tsʰoŋH**	***nə-[tsʰ]ᶜəŋ-s**
dzɛ:**ŋ**[1] 'punt (boat)' (v)	撐 **ʈʰæŋH**	***nə-tʰrᶜaŋ-s**
dzim[2] 'pointy' (adj)	尖 **tsjem**	***nə-tsem**
dzim[5] 'occupy' (v)	佔 **tɕemH**	***nə-tem-s**
dzi:**ŋ**[1] 'rank smell (of fish)' (n)	腥 **seŋ**	***nə-[s]ᶜeŋ**
dzje[5] 'tear' (v)	撕 **sej**	***nə-se**
dzou[1] 'rent' (v; n)	租 **tsu**	***nə-[ts]ᶜa**
dz̸a:**n**[2] 'snore' (v)	鼾 **xan**	***nə-[ŋ̊|qʰ]ᶜa[n]**
gau[5] 'knock' (v)	敲 **kʰæw**	***nə-krᶜaw**
go:**p**[7] 'knock, click' (v)	磕 **kʰap**	***nə-kʰᶜap**

5 Conclusion

This paper illustrates how Baxter and Sagart's reconstruction system can be productively applied to new material, and show the value of systematically studying the traces of prenasalization in one single Hmong-Mien variety: while some of the etyma discussed in this paper are also found in other HM languages, there are also a certain number of important forms that may be only attested in this variety (and closely related ones). These data can serve as basic material for future OC reconstruction systems, and similar studies on each of the Hmong-Mien languages would be desirable.

Given the number of languages involved, automatic methods may provide an efficient wait to identify possible Chinese cognates in Hmong-Mien and other languages (List et al. 2017), and to collect as much evidence as possible on prenasalization in OC.

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